



AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1 - 22. (Cancelled)

23. (Previously Presented) A method according to claim 48, employing a pipe-laying vessel comprising:

an upwardly extending tower assembly defining a path down which a pipe of a pipeline passes as the pipeline is being laid by the vessel; and

a lower guide arrangement for guiding the pipeline after it has passed down the tower, the lower guide arrangement including a plurality of sets of guide rollers spaced apart along the path of the pipeline and defining the lateral limits of the path, the guide rollers being located such that they allow some bending of the pipeline as it passes through the lower guide arrangement.

24. (Previously Presented) A method according to claim 48, further comprising monitoring forces exerted on the pipeline by one or more of the guide rollers and adjusting the operation of the vessel in dependence upon the monitoring.

25. (Previously Presented) A method according to claim 23, further comprising monitoring forces exerted on the pipeline by one or more of the guide rollers and adjusting the operation of the vessel in dependence upon the monitoring.

26. (Previously Presented) A method according to claim 48, in which the force is monitored with load cells.

27. (Previously Presented) A method according to claim 26, wherein signals from the load cells are received by a control station.

28. (Previously Presented) A method according to claim 27, in which the control station provides signals for the operation of piston and cylinder arrangements for operating the guide rollers.

29. (Previously Presented) A method according to claim 28, in which the signals provided by the control station are passed to a hydraulic supply and control valve station.

30 - 35. (Cancelled)

36. (Previously Presented) A method according to claim 48, in which the operation of the vessel is adjusted in dependence upon the monitoring.

37. (Previously Presented) A method according to claim 48, in which the direction or speed of travel of the vessel is adjusted in dependence upon the monitoring.

38. (Previously Presented) A method according to claim 48, in which the pipe laying operation is adjusted in dependence upon the monitoring.

39. (Previously Presented) A method according to claim 23, in which the operation of the vessel is adjusted in dependence upon the monitoring.

40. (Previously Presented) A method according to claim 23, in which the direction or speed of travel of the vessel is adjusted in dependence upon the monitoring.

41. (Cancelled)

42. (Currently Amended) A method of J-laying a pipeline from a vessel, comprising:

lowering the pipeline down an upwardly extending tower assembly of the vessel and then through a lower guide arrangement, the lower guide arrangement including a plurality of sets of guide rollers spaced apart along the path of the pipeline and defining the lateral limits of the pipeline, the pipeline undergoing some bending so that the pipeline is less vertical as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide arrangement; and

monitoring forces applied to the pipeline by rollers of the lower guide arrangement at each set of rollers of the lower guide arrangement;

wherein each of the sets of guide rollers defines a respective set diameter and the set diameters increase nonlinearly in the direction of travel of the pipeline during laying.

43. (Currently Amended) A method of J-laying a pipeline from a vessel, comprising:

lowering the pipeline down an upwardly extending tower assembly of the vessel and then through a lower guide arrangement, the lower guide arrangement including a plurality of sets of guide rollers spaced apart along the path of the pipeline and defining the lateral limits of the pipeline, each set of guide rollers being arranged to substantially surround the pipeline, the pipeline undergoing some bending so that the pipeline is less vertical as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide arrangement; and

monitoring forces applied to the pipeline by rollers of the lower guide arrangement at each set of rollers of the lower guide arrangement;

wherein each of the sets of guide rollers defines a respective set diameter and the set diameters increase nonlinearly in the direction of travel of the pipeline during laying.

44. (Cancelled)

45. (Previously Presented) A pipe-laying vessel for J-laying a pipe, the vessel comprising:

an upwardly extending tower assembly defining a path down which a pipe of a pipeline passes as the pipeline is being laid in a J-laying process by the vessel; and

a lower guide arrangement for guiding the pipeline after it has passed down the tower, the lower guide arrangement being substantially trumpet shape, flaring outwardly in the direction of travel of the pipeline during laying, and the lower guide arrangement including a plurality of sets of guide rollers spaced apart along the path of the pipeline and defining the lateral limits of the path, and each of the sets of guide rollers defines a respective set diameter and the set diameters increase nonlinearly in the direction of travel of the pipeline during laying the guide rollers being located such that they allow some bending of the pipeline so that the pipeline as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide arrangement; and

means for monitoring forces applied to the pipeline by rollers of the lower guide arrangement.

46. (Currently Amended) A method of J-laying a pipeline from a vessel, comprising:

lowering the pipeline down an upwardly extending tower assembly of the vessel and then through a lower guide arrangement, the lower guide arrangement being substantially trumpet shape, flaring outwardly in the direction of travel of the pipeline during laying, the angle of flare increasing in the direction of travel of the pipeline during laying, and including a plurality of sets of guide rollers spaced apart

along the path of the pipeline and defining the lateral limits of the pipeline, the pipeline undergoing some bending so that the pipeline is less vertical as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide arrangement;

monitoring forces applied to the pipeline by rollers of the lower guide arrangement; and

providing signals for operation of piston and cylinder arrangements for operating the guide rollers;

wherein each of the sets of guide rollers defines a respective set diameter and the set diameters increase nonlinearly in the direction of travel of the pipeline during laying.

47. (Currently Amended) A pipe-laying vessel for J-laying a pipe, the vessel comprising:

an upwardly extending tower assembly defining a path down which the pipe passes as a pipeline is being J-laid by the vessel;

a lower guide arrangement for guiding the pipeline after it has passed down the tower, the lower guide arrangement including a plurality of sets of guide rollers spaced apart along the path of the pipeline and defining lateral limits of the path, the guide rollers being located such that they allow some bending of the pipeline so that the pipeline is less vertical as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide arrangement;

a plurality of sets of adjustable rollers for adjusting a position of the pipeline as it passes through the lower guide arrangement;

means for monitoring forces applied to the pipeline by the adjustable rollers;

piston and cylinder arrangements for operating the adjustable rollers; and

a control station for receiving signals from the force monitoring means and for providing signals for the operation of the piston and cylinder arrangements for operating the adjustable rollers; wherein each of the sets of guide rollers defines a respective set diameter and the set diameters increase nonlinearly in the direction of travel of the pipeline during laying.

48. (Currently Amended) A method ~~according to claim 22,~~ of J-laying a pipeline from a vessel, comprising:

lowering the pipeline down an upwardly extending tower assembly of the vessel and then through a lower guide arrangement, the lower guide arrangement including a plurality of sets of guide rollers spaced apart along the path of the pipeline and defining the lateral limits of the pipeline, the pipeline undergoing some bending so that the pipeline is less vertical as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide arrangement; and

monitoring forces applied to the pipeline by rollers of the lower guide arrangement;

wherein each of the sets of guide rollers defines a respective set diameter and the set diameters increase nonlinearly in the direction of travel of the pipeline during laying.

Claims 49 - 52. (Cancelled)